AMENDMENTS TO THE SPECIFICATION

Please substitute the following replacement paragraph for the paragraph at page 5, lines 4-5 of the specification:

--FIGURE 4 is a view similar to FIGURES 2 and 3 when the deviation is a relatively ~~large~~ low amount, but in the opposite direction from the examples illustrated in FIGURES 2 and 3; --

Please substitute the following replacement paragraph for the paragraph at page 6, line 2 through page 7, line 21 of the specification:

--Referring now to the drawings wherein the showings are for the purpose of illustrating a preferred embodiment of the invention only and not for the purpose of limiting same, FIGURE 1 illustrates apparatus A having a balancing bridge 10, like a wheatstone bridge, with branches 12, 14, 16 and 18. In branch 12, an induction measuring coil 20 having a give number of turns and a length x, as shown in FIGURE 5, constitutes the impedance of this branch. In practice, the length is less than 6.0 inches. In a like manner, resistor 22 constitutes the impedance of branch 14 connected in series with branch 12. On the opposite side of bridge 10, reference induction coil 30 has the same number of turns as coil 20 and the same length x. This branch is connected in series with branch 18 comprises a resistor 32 generally the same as resistor 22 and an adjustable resistor 34 for zeroing the output of bridge 10 when coils 20, 30 are loaded. The input of the bridge is an AC current at nodes 40, 42 from leads 44, 46 across which a sine wave signal S is provided by generator 50 within LVDT, designated as the IC circuit B circumscribed by dashed lines. Bridge 10 has output nodes 60, 62 connected by leads 64, 66, respectively, to amplifier 80 through current limiting resistors 70, 72. Amplifier 80 is a standard operational amplifier to transmit the sine wave voltage signal between nodes 60, 62. The amplifier is illustrated with a positive input connected through resistor 82 and capacitor 84 to ground 86. The gain of amplifier 80 is controlled by the resistor 88 so that the signal in output line 90 is a sine wave, as shown in FIGURES 2-4 and is directed to the demodulator and phase detector 100 of LVDT. In practice the LVDT is a chip sold by Philips Semiconductors as part number NE 5521. Demodulator and phase detector 100 has inputs 102, 104 from generator 50 whereby the sine wave signal S which drives nodes 40, 42 is a synchronization input to the demodulator. The other input is the sine wave on line 90 at terminal 106, so output 108 includes a magnitude signal passed through filter 110 to output line 112. The magnitude on line 112 is either digital or analog between a maximum and minimum, normally 0-10. This data is transmitted to

output device 120 illustrated as having a visual display 122 and an alarm 124 in the form using light or sound. Since the signal on line 112 is calibrated between 0-10, the midpoint 5 is the desired output for apparatus A. Device 120 is set so alarm 124 signals a deviation of a given amount from the midpoint of the calibrated output on line 112. This signal indicates the comparison of the measured inductive reactance of coil 20 and the reference inductive reactance of coil 30. Apparatus A is used to determine the amount of core fill in electric welding wire W traveling in a path P through the center of coil 20. To provide a desired inductive reactance for comparison to the physical condition of moving wire W, coil 30 has a fixed internal core 150 having the desired physical characteristics for wire W. To set up apparatus A for the purpose of determining the percentage of fill in a cored wire W, core 150 is a length of the desired cored wire. This piece of wire is fixed in coil 30, as shown in FIGURE 7. At the same time, a similar section of the wire having the desired percentage fill is placed within coil 20. With these two sections being the same, ~~resistor 32~~ resistor 34 is adjusted to produce a 0 output at nodes 60, 62. After a calibration procedure, wire W from sizing die of the processing line is passed through coil 20 along path P. The output sine wave or voltage signal in line 90 is indicative of the relationship between the measured inductive reactance of coil 20 and the reference inductive reactance of coil 30. If the core is the desired fill volume, the thickness of the metal in its outer sheath will be the desired value. This produces a 0 output in lines 64, 66 and a midpoint desired signal in line 112. In practice, the midpoint reading is 5.--

Please substitute the following replacement paragraph for the paragraph at page 8, line 1 through page 9, line 1 of the specification:

--If the volume of the fill is too large, a high amplitude voltage signal, such as signal 200 in FIGURE 2 is created. The signal has a period 2 X c and an amplitude b. The signal has a positive polarity, indicating that the measured inductive reactance deviates greatly from the reference inductive reactance. This signal means the measured inductance is too high as compared with the reference inductive reactance or too low with respect to the inductive reactance of the reference. The deviation is high in FIGURE 2. As the volume of fill material changes toward the desired amount, the magnitude, or amplitude, b is reduced, as shown by voltage signal 202 in FIGURE 3. The magnitude b' is moving toward 0 which is the desired inductive reactance for the desired amount of fill and, thus, the desired thickness of the surrounding metal sheath. As the fill continues to change beyond the desired amount in the opposite direction of deviation, the signal on line 90 changes

polarity, as indicated by signal 204 in FIGURE 4. This polarity indicates that the inductive reactance of moving the wire W is substantially less than the inductive reactance of the reference coil 30 so the fill is in the opposite direction of deviation from the desired amount. Inductive reactance of coil 20, thus, indicates the wall thickness. When the wall thickness is at the desired level, the fill percentage is at the desired amount and there is no output signal at nodes 60, 62. Such signals from amplifier 80 as represented as signals 200, 202 and 204 in FIGURES 2-4 are directed to demodulator 100. The input signal S on lines 102, 104 is compared to the signal on line 90 to produce a gradient output in line 108. In practice, with a 0 signal in line 90, the output on line 112 is an intermediate number or level, such as 5. As the magnitude or amplitude of the signal on line 90 increases indicating either a deviation above the desired level or below the desired level, the number or level on line 112 increases or decreases. This is read by device 120 in visual display 122. If the deviation exceeds a certain amount, ~~alarm 24~~alarm 124 is activated.--

Please substitute the following replacement paragraph for the paragraph at page 9, line 2 through page 9, line 19 of the specification:

--As shown in FIGURE 5, wire W moving through coil 20 produces an inductive reactance XL which varies according to the amount of fill 222 in sheath 220. The desired amount of fill for a given diameter d of wire W produces a desired percentage of fill and is shown in FIGURE 6A. This fill creates a wall thickness y for sheath 220. With this wall thickness and percentage fill of core material 222, no signal is created between node 60 and node 62 as wire W passes through coil 20. If the amount of fill is decreased, as shown in FIGURE 6B, the wall thickness is increased as indicated by y'. In a like manner, if the fill of core material 222 is increased, wall thickness y" is decreased in FIGURE 6C. The wall thickness determines the inductive reactance of ~~coil 30~~coil 20 having a length x as shown in FIGURE 5. In practice the length is less than 6 inches. To provide a reference inductive reactance, the desired volume of fill as shown in ~~FIGURE 3A~~FIGURE 8A in a core 150 in the form of a piece of wire W is placed in reference coil 30 having the same number of turns and the same length x as the measuring coil 20. The desired physical characteristics of wire W as shown in FIGURES 6A, 8A, produces a reference inductive reactance XR for coil 30. If the inductive reactance for the reference coil is the same as the inductive reactance for the measuring coil, no signal appears in line 90. As the core material decreases or increases as shown in FIGURES 6B, 6C, respectively, the inductive reactance of ~~core~~coil 20 changes with respect to the reference inductive

reactance to produce signals as discussed in FIGURES 2-4 for the purpose of creating a magnitude level along a gradient appearing in line 112 of apparatus A.--